

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year) 06 July 2001 (06.07.01)	
International application No. PCT/ZA00/00140	Applicant's or agent's file reference PCT/2000/046
International filing date (day/month/year) 18 August 2000 (18.08.00)	Priority date (day/month/year) 19 August 1999 (19.08.99)
Applicant JAKOVLEJVIC, Branimir	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

15 March 2001 (15.03.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer S. Mafla (Fax 338.87.40) Telephone No.: (41-22) 338.83.38
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PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

To:

LE ROUX, Marius
D.M. KISCH Inc.
P.O. Box 781218
SANDTON 2146
AFRIQUE DU SUD

Date of mailing
(day/month/year) 07.01.2002

Applicant's or agent's file reference
PCT/2000/046

IMPORTANT NOTIFICATION

International application No.
PCT/ZA00/00140

International filing date (day/month/year)
18/08/2000

Priority date (day/month/year)
19/08/1999

Applicant
JAKOVLEJVIC, Branimir

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/

 European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer

Schuster-Kaechele, W

Tel. +49 89 2399-2281



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PCT/2000/046		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/ZA00/00140	International filing date (<i>day/month/year</i>) 18/08/2000	Priority date (<i>day/month/year</i>) 19/08/1999	
International Patent Classification (IPC) or national classification and IPC H01F27/02			
Applicant JAKOVLEJVIC, Branimir			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 5 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 15/03/2001	Date of completion of this report 07.01.2002
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Gols, J Telephone No. +49 89 2399 2616



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/ZA00/00140

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1,3-10	as originally filed	
2	with telefax of	30/11/2001

Claims, No.:

1-15	with telefax of	30/11/2001
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Drawings, sheets:

1/6-6/6	as originally filed	
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2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/ZA00/00140

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-15
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-15
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-15
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

V

1. Claim 1:

Technical field: An electrical assembly.

Prior art: X-document D1: PATENT ABSTRACTS OF JAPAN vol. 006, no. 115 (E-115), 26 June 1982 (1982-06-26) & JP 57 043405 A (HITACHI LTD;OTHERS: 01), 11 March 1982 (1982-03-11) discloses an electrical assembly comprising a transformer and a permanent cover or case for the electrical assembly. The transformer is insulated by means of an unsaturated polyester resin which provides adherence to transformer parts, i.e. the bobbin, case and charger of the transformer. The polyester resin is mixed with a transparent resin and moulded with polybutyleneterephthalate mixed with carbon black for forming the transformer. Due to the presence of carbon black, the bobbin, case and charger of the transformer are not made of a transparent material. The remaining A-documents do not provide further relevant information.

Problem: To provide a transformer having a cover which prevents absorption of heat generated by the transformer.

Solution: According to claim 1, the electrical assembly comprises a transformer and a translucent electricity insulating cover.

Inventive step: Due to the fact that the cover is translucent and therefore not opaque, the cover effectively can transmit the heat generated by the transformer outwardly without excessive heat absorption in the cover. In D1 the cover comprises carbon black and is not translucent. In fact due to the amount of carbon black (more than two parts by weight), the cover is black and thus absorbs heat more than the translucent cover as claimed. Furthermore there is no teaching in the prior art as cited in the International Search Report to provide a translucent cover for the transformer. Consequently claim 1 meets the requirements of Articles 33(2) - (4) PCT, however see the objection under VIII below.

2. Claim 13:

The claim is directed to a method of forming an electrical assembly comprising the step of providing a transformer and permanently enclosing the transformer in a translucent electricity insulating cover which, in use transmits heat generated by

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/ZA00/00140

the transformer. The claim is considered to meet the requirements of Articles 33(2) - (4) PCT for the reason as given above.

2. Claims: 2 - 12 and 14:

These dependent claims are related to embodiments of the invention as set out in the independent claims and as such meet the requirements of Article 33(2) - (4) PCT.

VII

1. To meet the requirements of Rule 5.1(a)(ii) PCT, the document D1 should have been identified in the description and the relevant background art disclosed therein should have been briefly discussed.

VIII

1. Claim 1:

Claim 1 is interpreted in accordance with the description and claim 13 in that it is the cover which allows the heat dissipated by the transformer to be transmitted outwardly. Consequently claim 1 should have defined that the heat which is generated by the transformer is transmitted outwardly by means of the cover.

2. In the claims and the description, the feature "translucent electricity insulating" should have been replaced by "translucent electrically insulating".
3. In some of the dependent claim features previously defined have been introduced by means of an improper antecedent (e.g. in claim 15 "a" rigid transparent shell) which should have been introduced by a proper antecedent ("the" rigid transparent shell).

of the cap. The cap is normally mounted on the board to abut against the board and as a consequence, a cavity is formed between the board and the aforementioned bottom wall. In use and as a result of variations in temperature in the cavity, air-entraining moisture moves into and is trapped in the cavity. Over a period of time, this moisture causes damage to the printed circuit board.

OBJECTIVE OF THE INVENTION

Accordingly, it is an object of the present invention to provide apparatus and a method of producing same with which the applicant believes the aforementioned disadvantages may at least be alleviated.

SUMMARY OF THE INVENTION

According to the invention there is provided an electric assembly comprising a transformer and a translucent electricity insulting cover therefor.

The cover is preferably transparent. The transformer may also comprise a transparent bobbin on which a core for the transformer and transformer windings are provided.

CLAIMS

1. An electric assembly comprising a transformer and a translucent electricity insulting permanent cover therefor.

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2. An assembly as claimed in claim 1 wherein the cover is transparent.

3. An assembly as claimed in any one of the preceding claims wherein the transformer comprises a transparent bobbin on which a core for the transformer and transformer windings are provided.

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4. An assembly as claimed in any one of the preceding claims wherein the cover is in the form of a skin.

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5. An assembly as claimed in claim 4 wherein the skin comprises a transparent outer shell of a rigid material and a layer of a transparent filling material provided between the shell and the transformer.

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6. An assembly as claimed in claim 5 wherein the shell comprises first and second body halves fitted together to form the shell.

7. An assembly as claimed in any one of claims 4 to 6 wherein the skin comprises outwardly extending protrusions, to provide a clearance between the skin and a surface on which the assembly is mounted in use.

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8. An assembly as claimed in any one of claims 1 to 3 wherein the cover comprises a plurality of pins for mating with and making electrical contact with a conventional socket arrangement.

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9. An assembly as claimed in claim 8 wherein the transformer forms part of power supply circuitry, the power supply circuitry comprising a first output which is accessible through the cover.

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10. An assembly as claimed in claim 9 wherein the power supply circuitry comprises a second output which is in parallel with the first output and also accessible through the cover.

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11. An assembly as claimed in any one of claims 9 and 10 wherein the circuitry comprises a fuse and the fuse is provided in a recess in the cover.

12. An assembly as claimed in claim 11 wherein the cover comprises a lid for opening and closing the recess.

13. A method of forming an electric assembly, the method comprising the steps of:

- providing a transformer; and
- permanently enclosing the transformer in a translucent electricity insulating cover.

14. A method as claimed in claim 13 wherein the transformer is enclosed by locating the transformer in a rigid transparent shell.

15. A method as claimed in claim 14 wherein the transformer is located by providing a rigid transparent shell having a shape substantially the same as a general shape of the transformer; mounting the transformer in the shell so that a small clearance is defined between substantially a whole of an outer surface of the transformer and the shell; and filling the clearance with a transparent electricity insulating material.

16. An electric assembly substantially as herein described with reference to the accompanying diagrams.

17. An transformer assembly substantially as herein described with reference to the accompanying diagrams.

18. A power supply assembly substantially as herein described with reference to the accompanying diagrams.

19. A method of forming an electric assembly substantially as herein described with reference to the accompanying diagrams.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference PCT/2000/046	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/ZA 00/00140	International filing date (day/month/year) 18/08/2000	(Earliest) Priority Date (day/month/year) 19/08/1999
Applicant JAKOVLEJVIC, Branimir		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

2

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/ZA 00/00140

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H01F27/02 H01F41/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

PAJ, EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 006, no. 115 (E-115), 26 June 1982 (1982-06-26) & JP 57 043405 A (HITACHI LTD;OTHERS: 01), 11 March 1982 (1982-03-11) abstract	1,2,13, 14
A	--- PATENT ABSTRACTS OF JAPAN vol. 002, no. 088 (E-044), 19 July 1978 (1978-07-19) & JP 53 052922 A (HITACHI LTD), 13 May 1978 (1978-05-13) abstract	
A	--- US 4 008 205 A (JONES MICHAEL EDWARD BENET) 15 February 1977 (1977-02-15) --- -/--	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

° Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

G document member of the same patent family

Date of the actual completion of the international search

23 November 2000

Date of mailing of the international search report

30/11/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040. Tx. 31 651 epo nl.
Fax: (+31-70) 340-3016

Authorized officer

Vanhulle, R

INTERNATIONAL SEARCH REPORT

International Application No

P 00/00140

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication where appropriate of the relevant passages	Relevant to claim No
A	EP 0 859 384 A (CANON KK) 19 August 1998 (1998-08-19) -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

EP 00/00140

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 57043405 A	11-03-1982	NONE	
JP 53052922 A	13-05-1978	NONE	
US 4008205 A	15-02-1977	CA 1017097 A CH 487970 A DE 1520131 A DK 112975 B LU 44736 A SE 321354 B SE 353100 B US 4008204 A US 4008203 A US 4052365 A US 3951918 A US 3957665 A US 4094867 A	06-09-1977 31-03-1970 06-04-1972 03-02-1969 04-01-1964 02-03-1970 22-01-1973 15-02-1977 15-02-1977 04-10-1977 20-04-1976 18-05-1976 13-06-1978
EP 0859384 A	19-08-1998	JP 10229025 A JP 10229019 A JP 10241953 A JP 10241954 A JP 10241977 A JP 11204958 A US 6144278 A	25-08-1998 25-08-1998 11-09-1998 11-09-1998 11-09-1998 30-07-1999 07-11-2000

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference PCT/2000/046	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/ZA00/00140	International filing date (day/month/year) 18/08/2000	Priority date (day/month/year) 19/08/1999
International Patent Classification (IPC) or national classification and IPC H01F27/02		
Applicant JAKOVLEJVIC, Branimir		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
 - ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 15/03/2001	Date of completion of this report 07.01.2002
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Gols, J Telephone No. +49 89 2399 2616 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/ZA00/00140

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1,3-10	as originally filed	
2	with telefax of	30/11/2001

Claims, No.:

1-15	with telefax of	30/11/2001
------	-----------------	------------

Drawings, sheets:

1/6-6/6	as originally filed
---------	---------------------

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/ZA00/00140

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-15
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-15
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-15
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

V

1. Claim 1:

Technical field: An electrical assembly.

Prior art: X-document D1: PATENT ABSTRACTS OF JAPAN vol. 006, no. 115 (E-115), 26 June 1982 (1982-06-26) & JP 57 043405 A (HITACHI LTD;OTHERS: 01), 11 March 1982 (1982-03-11) discloses an electrical assembly comprising a transformer and a permanent cover or case for the electrical assembly. The transformer is insulated by means of an unsaturated polyester resin which provides adherence to transformer parts, i.e. the bobbin, case and charger of the transformer. The polyester resin is mixed with a transparent resin and moulded with polybutyleneterephthalate mixed with carbon black for forming the transformer. Due to the presence of carbon black, the bobbin, case and charger of the transformer are not made of a transparent material. The remaining A-documents do not provide further relevant information.

Problem: To provide a transformer having a cover which prevents absorption of heat generated by the transformer.

Solution: According to claim 1, the electrical assembly comprises a transformer and a translucent electricity insulating cover.

Inventive step: Due to the fact that the cover is translucent and therefore not opaque, the cover effectively can transmit the heat generated by the transformer outwardly without excessive heat absorption in the cover. In D1 the cover comprises carbon black and is not translucent. In fact due to the amount of carbon black (more than two parts by weight), the cover is black and thus absorbs heat more than the translucent cover as claimed. Furthermore there is no teaching in the prior art as cited in the International Search Report to provide a translucent cover for the transformer. Consequently claim 1 meets the requirements of Articles 33(2) - (4) PCT, however see the objection under VIII below.

2. Claim 13:

The claim is directed to a method of forming an electrical assembly comprising the step of providing a transformer and permanently enclosing the transformer in a translucent electricity insulating cover which, in use transmits heat generated by

the transformer. The claim is considered to meet the requirements of Articles 33(2) - (4) PCT for the reason as given above.

2. Claims: 2 - 12 and 14:

These dependent claims are related to embodiments of the invention as set out in the independent claims and as such meet the requirements of Article 33(2) - (4) PCT.

VII

1. To meet the requirements of Rule 5.1(a)(ii) PCT, the document D1 should have been identified in the description and the relevant background art disclosed therein should have been briefly discussed.

VIII

1. Claim 1:

Claim 1 is interpreted in accordance with the description and claim 13 in that it is the cover which allows the heat dissipated by the transformer to be transmitted outwardly. Consequently claim 1 should have defined that the heat which is generated by the transformer is transmitted outwardly by means of the cover.

2. In the claims and the description, the feature "translucent electricity insulating" should have been replaced by "translucent electrically insulating".
3. In some of the dependent claim features previously defined have been introduced by means of an improper antecedent (e.g. in claim 15 "a" rigid transparent shell) which should have been introduced by a proper antecedent ("the" rigid transparent shell).

5

OBJECTIVE OF THE INVENTION

10

SUMMARY OF THE INVENTION

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CLAIMS

1. An electric assembly (20, 50) comprising a transformer (30, 56) and a translucent electricity insulating permanent cover (31, 52) therefor, to transmit heat generated by the transformer outwardly.

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2. An assembly as claimed in claim 1 wherein the cover (31, 52) is transparent.

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3. An assembly as claimed in any one of the preceding claims wherein the transformer comprises a transparent bobbin (22) on which a core (23) for the transformer and transformer windings are provided.

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4. An assembly as claimed in any one of the preceding claims wherein the cover is in the form of a skin (38).

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5. An assembly as claimed in claim 4 wherein the skin (38) comprises a transparent outer shell (31) of a rigid material and a layer (37) of a transparent filling material provided between the shell and the transformer.

6. An assembly as claimed in claim 5 wherein the shell comprises first and second body halves (32, 34) fitted together to form the shell.

7. An assembly as claimed in any one of claims 4 to 6 wherein the skin comprises outwardly extending protrusions (33), to provide a clearance between the skin and a surface on which the assembly is mounted in use.

5

8. An assembly as claimed in any one of claims 1 to 3 wherein the cover comprises a plurality of pins (58) for mating with and making electrical contact with a conventional socket arrangement.

10

9. An assembly as claimed in claim 8 wherein the transformer forms part of power supply circuitry (54), the power supply circuitry comprising a first output (66) which is accessible through the cover.

15

10. An assembly as claimed in claim 9 wherein the power supply circuitry comprises a second output (68) which is in parallel with the first output and also accessible through the cover.

20

11. An assembly as claimed in any one of claims 9 and 10 wherein the circuitry comprises a fuse (62) and the fuse is provided in a recess (60) in the cover.

12. An assembly as claimed in claim 11 wherein the cover comprises a lid (64) for opening and closing the recess.
13. A method of forming an electric assembly, the method comprising the steps of:
- providing a transformer (30,56); and
 - permanently enclosing the transformer in a translucent electricity insulating cover (31, 52) which, in use, transmits heat generated by the transformer.
14. A method as claimed in claim 13 wherein the transformer is enclosed by locating the transformer in a rigid transparent shell (31).
15. A method as claimed in claim 14 wherein the transformer is located by providing a rigid transparent shell (31) having a shape substantially the same as a general shape of the transformer; mounting the transformer (30) in the shell so that a small clearance is defined between substantially a whole of an outer surface of the transformer and the shell; and filling the clearance with a transparent electricity insulating material (37).

PATENT COOPERATION TREATY

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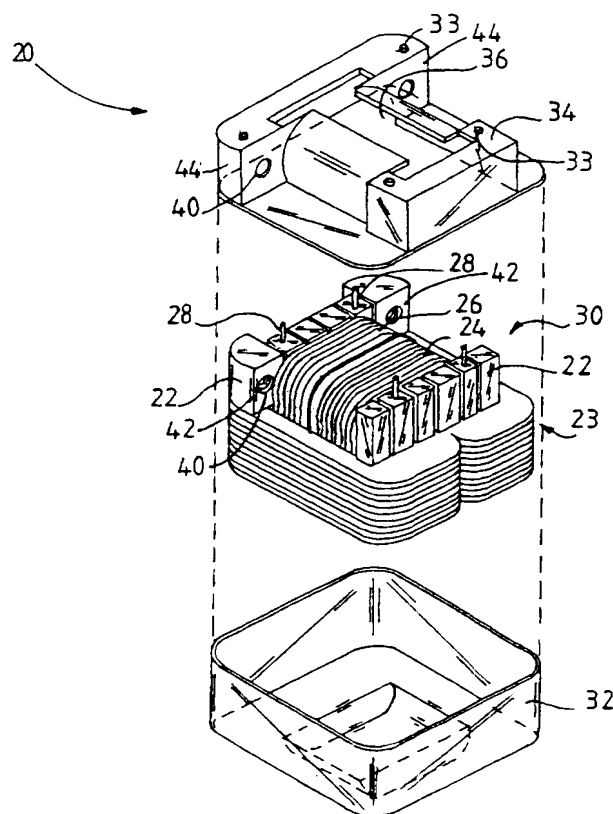
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(54) Title: ENCAPSULATED TRANSFORMER



(57) Abstract: An encapsulated transformer assembly (20) comprises a transformer (30) enclosed by a transparent electricity insulating skin (32, 34). The transparent skin facilitates heat exchange resulting in more effective operation in use.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

ENCAPSULATED TRANSFORMER

TECHNICAL FIELD

THIS invention relates to transformers and other apparatus comprising
5 transformers, such as power supplies.

BACKGROUND ART

It is known electrically to insulate a transformer by centralizing the
transformer in an opaque plastic cap having a substantially rectilinear shape
10 and an open bottom and to fill the region between the transformer and
inside walls of the cap with an opaque insulating material. The material
normally forms a concave bottom wall in a region between the transformer
and a bottom of the cap. In use, heat is generated by the transformer and
since neither the cap nor the intermediate insulating material transmits heat
15 effectively, that heat is not dissipated effectively. This may cause damage
to the transformer or may at least give rise to higher electrical losses. This
problem is also encountered in other apparatus comprising transformers,
such as power supplies.

20 Furthermore, the aforementioned transformer assembly is normally mounted
on a printed circuit board by a plurality of legs extending from electrical
terminals on the transformer to a region beyond the aforementioned bottom

of the cap. The cap is normally mounted on the board to abut against the board and as a consequence, a cavity is formed between the board and the aforementioned bottom wall. In use and as a result of variations in temperature in the cavity, air-entraining moisture moves into and is trapped in the cavity. Over a period of time, this moisture causes damage to the printed circuit board.

OBJECTIVE OF THE INVENTION

Accordingly, it is an object of the present invention to provide apparatus and a method of producing same with which the applicant believes the aforementioned disadvantages may at least be alleviated.

SUMMARY OF THE INVENTION

According to the invention there is provided an electric assembly comprising a transformer and a translucent electricity insulting cover therefor.

The cover is preferably transparent. The transformer may also comprise a transparent bobbin on which a core for the transformer and transformer windings are provided.

In one embodiment the cover may be in the form of a skin.

The skin may comprise a transparent outer shell of a rigid material and a layer of a transparent filling material provided between the shell and the transformer. The shell may comprise first and second body halves fitted together to form the shell.

The skin may comprise outwardly extending protrusions, to provide a clearance between the skin and a surface on which the assembly is mounted in use.

In another embodiment, the cover may be in the form of a box and may comprise a plurality of pins for mating with and making electrical contact with a conventional socket arrangement.

The transformer may form part of power supply circuitry and the power supply circuitry may comprise a first output which is accessible through the cover. The power supply circuitry may further comprise a second output which is in parallel with the first output and which is also accessible through the cover.

The circuitry may comprise a fuse, and the fuse is preferably provided in a recess in the cover.

The cover may comprise a lid for opening and closing the recess.

5

Also included within the scope of the invention is a method of forming an electric assembly, the method comprising the steps of:

- providing a transformer; and
 - permanently enclosing the transformer in a translucent electricity
- 10 insulating cover.

The transformer may be enclosed by locating the transformer in a rigid transparent shell.

15 The transformer may be located by providing a rigid transparent shell having a shape substantially the same as a general shape of the transformer; mounting the transformer in the shell so that a small clearance is defined between substantially a whole of an outer surface of the transformer and the shell; and filling the clearance with a transparent electricity insulating

20 material.

BRIEF DESCRIPTION OF THE ACCOMPANYING DIAGRAMS

The invention will now further be described, by way of example only, with reference to the accompanying diagrams wherein:

figure 1 is a diagrammatic perspective view of a prior art transformer assembly;

figure 2 is a diagrammatic exploded perspective view of a transformer assembly according to the invention;

figure 3 is a diagrammatic perspective view of the assembly in figure 2, in assembled form;

figure 4 is a diagrammatic perspective view from above of a power supply assembly according to the invention;

figure 5 is a diagrammatic perspective view from below of the power supply assembly; and

figure 6 is a basic block diagram of the power supply in figure 4.

DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

A prior art transformer assembly is generally designated by the reference numeral 10 in figure 1. The assembly comprises a transformer (not shown) mounted in an opaque cap 12 defining an open bottom 14. A body of an opaque thermosetting epoxy resin 16 is provided in the cap to embed the

transformer, thereby to insulate it electrically and to mount it permanently in the cap.

5 Four conductive legs 18 connected to terminals (not shown) of the transformer extend beyond a concave bottom wall 17 formed by the resin and also beyond the open bottom 14 of the cap and are used to connect the transformer to external circuitry (also not shown).

10 The disadvantages of this assembly are referred to in the introduction of this specification.

15 A transformer assembly according to the invention is generally designated by the reference numeral 20 in figure 2. The assembly comprises a transformer 30 comprising a transparent bobbin 22 made of a suitable plastics material. A stack 23 of magnetic material laminates extend through and around the bobbin, to form the magnetic core of the transformer. The primary winding 24 and the secondary winding 26 of the transformer are provided on the bobbin in known manner. However, no insulating tape is provided about the windings, as is the case in some
20 known transformers, and transformer assemblies. Conductive legs 28 are connected to input and output terminals (not shown) of the transformer 30.

The assembly further comprises first and second body halves 32, 34 of a translucent, preferably transparent permanent shell 31 (shown in figure 3) of a suitable rigid plastics material. The two body halves collectively form the shell having a shape and configuration substantially similar to the general external shape of the transformer 30. When assembled, there is defined a small clearance between the shell 31 and the transformer 30 enclosed thereby. Second body half 34 defines an opening 36 in a center region thereof.

When making the assembly and after the shell 31 has been formed by clipping body halves 32 and 34 together, a transparent thermosetting material is introduced into the shell via opening 36 to fill the clearance, to form a thin layer between the transformer and shell and to displace air inside the shell. The material may be introduced by means of a suction mechanism and process. The material is then allowed to cure.

The assembly thus comprises a thin transparent skin 38 (shown in figure 3) for the transformer constituted by the transparent layer 37 and the transparent shell 31.

On body half 34, a plurality of externally extending protrusions or feet 33 are provided. When the assembly is mounted on a surface (not shown) the feet ensures that there is a permanent clearance (also not shown) between the shell 31 and the surface. This clearance improves heat exchange
5 between the assembly and the environment.

The legs 28 extend beyond the body half 34, so that the assembly 20 may be mounted on printed circuit boards (not shown) in well known manner. The feet 33 ensures that a permanent clearance is provided between the
10 assembly and the printed circuit board, to facilitate circulation of air between the transformer and the board and which improves the dissipation of heat generated by the transformer.

It is believed that with the transparent bobbin 22, no insulation type about
15 the windings (24, 26) and the thin transparent skin 38, heat generated by the transformer is transmitted outwardly more effectively than is the case with the aforementioned prior art transformers.

The assembly may define holes 40 in ear regions 42, 44, of the bobbin 22
20 and body half 34 respectively. These holes, which are easily accessible from a region in line with the centre axes of the holes, could be used to

mount the transponder on a chassis 46 by means of screws 48 or bolts and nuts, for example.

Accordingly, the compact assembly according to the invention is suitable
5 for both so-called printed circuit board and chassis mount.

In figures 4 and 5, there is shown a power supply assembly 50 according to the invention. The power supply assembly 50 comprises a transparent or translucent cover in the form of a box 52 for power supply circuitry 54,
10 comprising a transformer 56. The cover 52 facilitates the transmission of heat generated by the circuitry.

The cover comprises a plurality of pins 58 (two or three) for cooperating with a conventional socket arrangement (not shown) of a mains power
15 supply network. In a base 52.1 of the cover, there is provided a cavity 60 for a replaceable fuse 62 connected in either a primary or secondary circuit of the transformer. The cavity is openable and closeable by a removable lid 64.

20 The cover defines a first opening providing access to a first pair of DC output terminals 66 from the power supply. A second pair of output

terminals 68 connected in parallel with the first pair is also accessible through the cover.

5 A block diagram of the power supply is shown in figure 6. The
aforementioned pins are designated 58 and are connected to protective
circuitry 70 comprising lightning protection circuitry and the primary
winding 72 of the transformer. A secondary winding 74 of the transformer
is connected to a voltage regulating circuit 76 and the regulating circuit is
connected to the output terminals 66 and 68. The fuse 62 may be
10 connected in the primary and/or the secondary circuit of the transformer.

It will be appreciated that there are many variations in detail on the
apparatus and method according to the invention without departing from
the scope and spirit of the appended claims.

15

20

CLAIMS

1. An electric assembly comprising a transformer and a translucent electricity insulting permanent cover therefor.

5

2. An assembly as claimed in claim 1 wherein the cover is transparent.

3. An assembly as claimed in any one of the preceding claims wherein the transformer comprises a transparent bobbin on which a core for the transformer and transformer windings are provided.

10

4. An assembly as claimed in any one of the preceding claims wherein the cover is in the form of a skin.

15

5. An assembly as claimed in claim 4 wherein the skin comprises a transparent outer shell of a rigid material and a layer of a transparent filling material provided between the shell and the transformer.

20

6. An assembly as claimed in claim 5 wherein the shell comprises first and second body halves fitted together to form the shell.

7. An assembly as claimed in any one of claims 4 to 6 wherein the skin comprises outwardly extending protrusions, to provide a clearance between the skin and a surface on which the assembly is mounted in use.

5

8. An assembly as claimed in any one of claims 1 to 3 wherein the cover comprises a plurality of pins for mating with and making electrical contact with a conventional socket arrangement.

- 10 9. An assembly as claimed in claim 8 wherein the transformer forms part of power supply circuitry, the power supply circuitry comprising a first output which is accessible through the cover.

- 15 10. An assembly as claimed in claim 9 wherein the power supply circuitry comprises a second output which is in parallel with the first output and also accessible through the cover.

- 20 11. An assembly as claimed in any one of claims 9 and 10 wherein the circuitry comprises a fuse and the fuse is provided in a recess in the cover.

12. An assembly as claimed in claim 11 wherein the cover comprises a lid for opening and closing the recess.

13. A method of forming an electric assembly, the method comprising the steps of:

- providing a transformer; and
- permanently enclosing the transformer in a translucent electricity insulating cover.

14. A method as claimed in claim 13 wherein the transformer is enclosed by locating the transformer in a rigid transparent shell.

15. A method as claimed in claim 14 wherein the transformer is located by providing a rigid transparent shell having a shape substantially the same as a general shape of the transformer; mounting the transformer in the shell so that a small clearance is defined between substantially a whole of an outer surface of the transformer and the shell; and filling the clearance with a transparent electricity insulating material.

16. An electric assembly substantially as herein described with reference to the accompanying diagrams.

17. An transformer assembly substantially as herein described with reference to the accompanying diagrams.

18. A power supply assembly substantially as herein described with reference to the accompanying diagrams.

19. A method of forming an electric assembly substantially as herein described with reference to the accompanying diagrams.

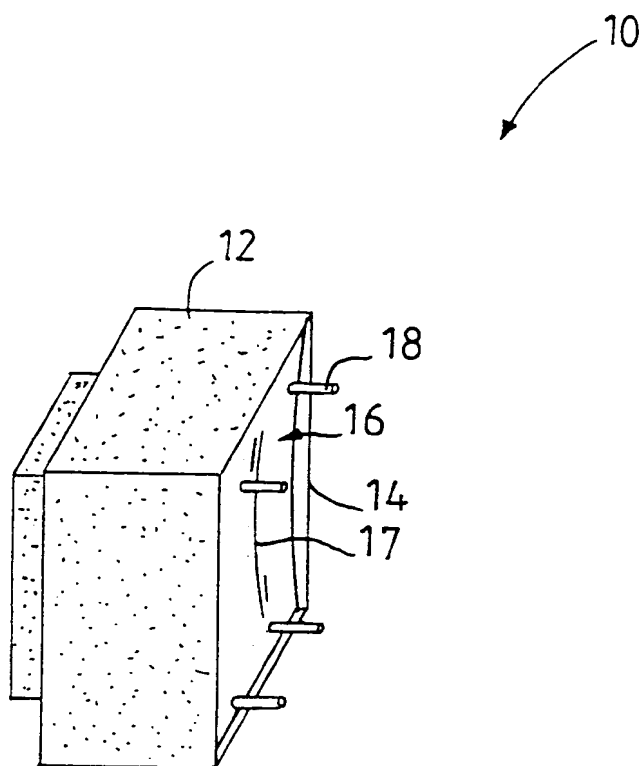
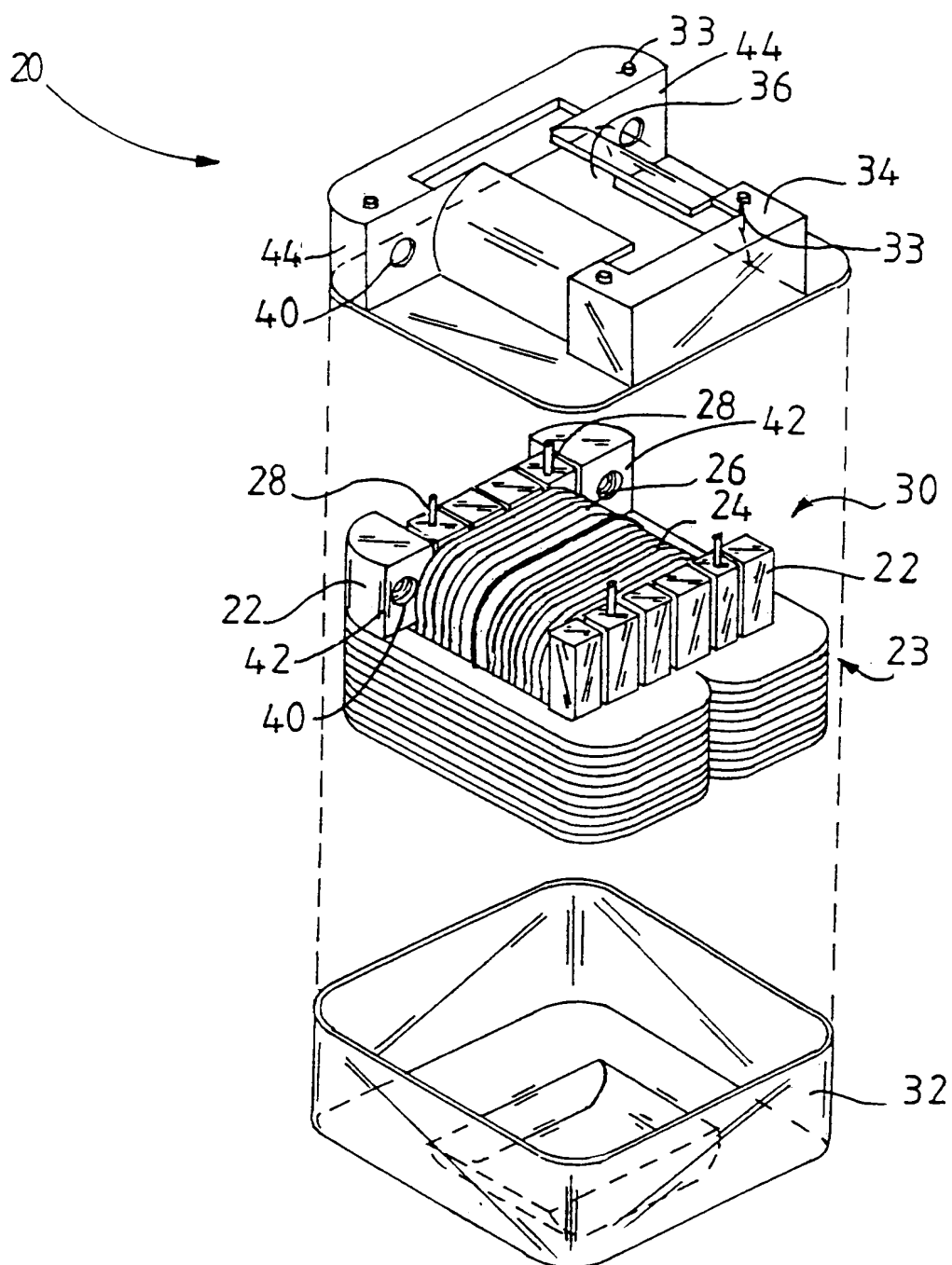
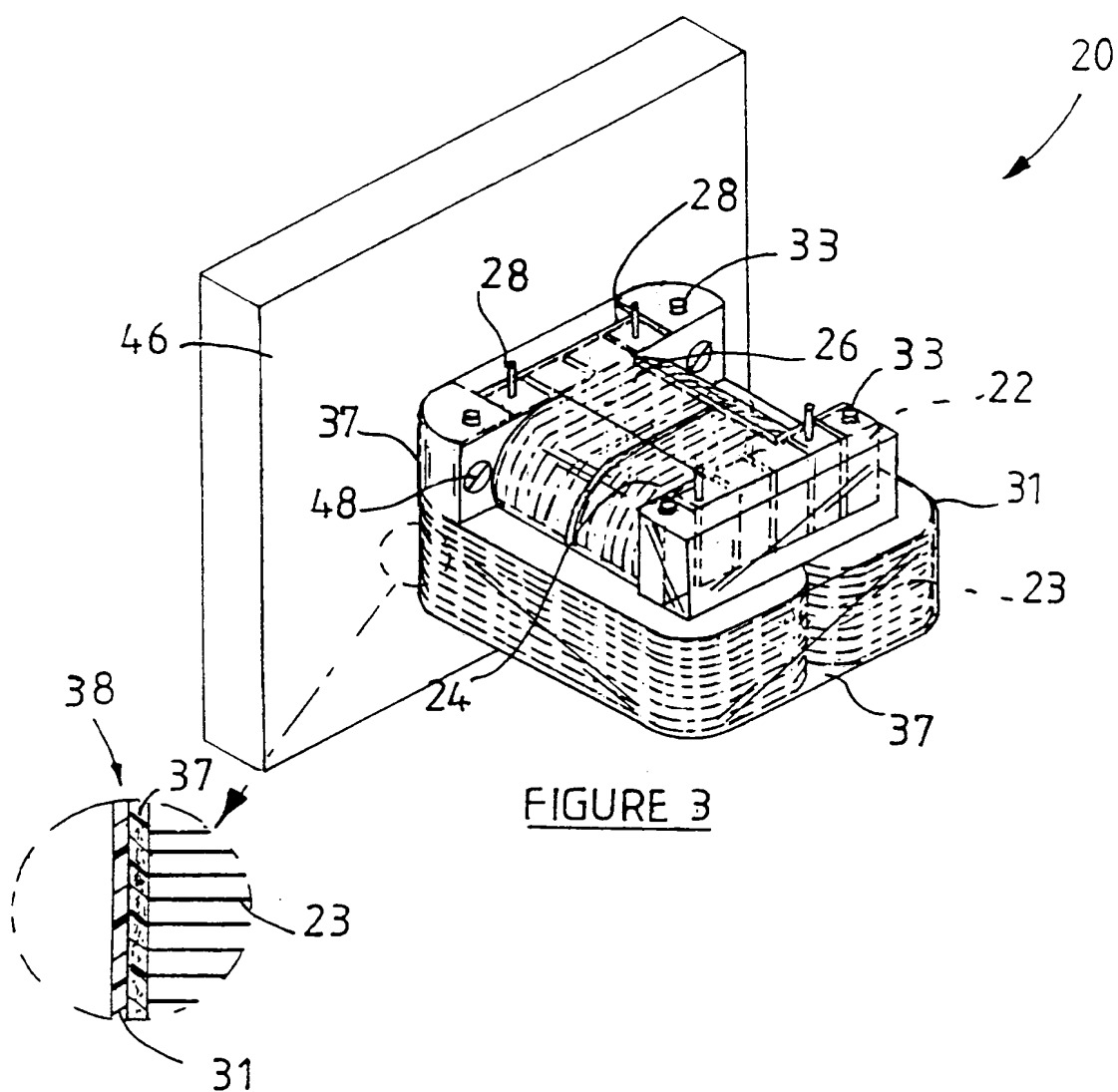
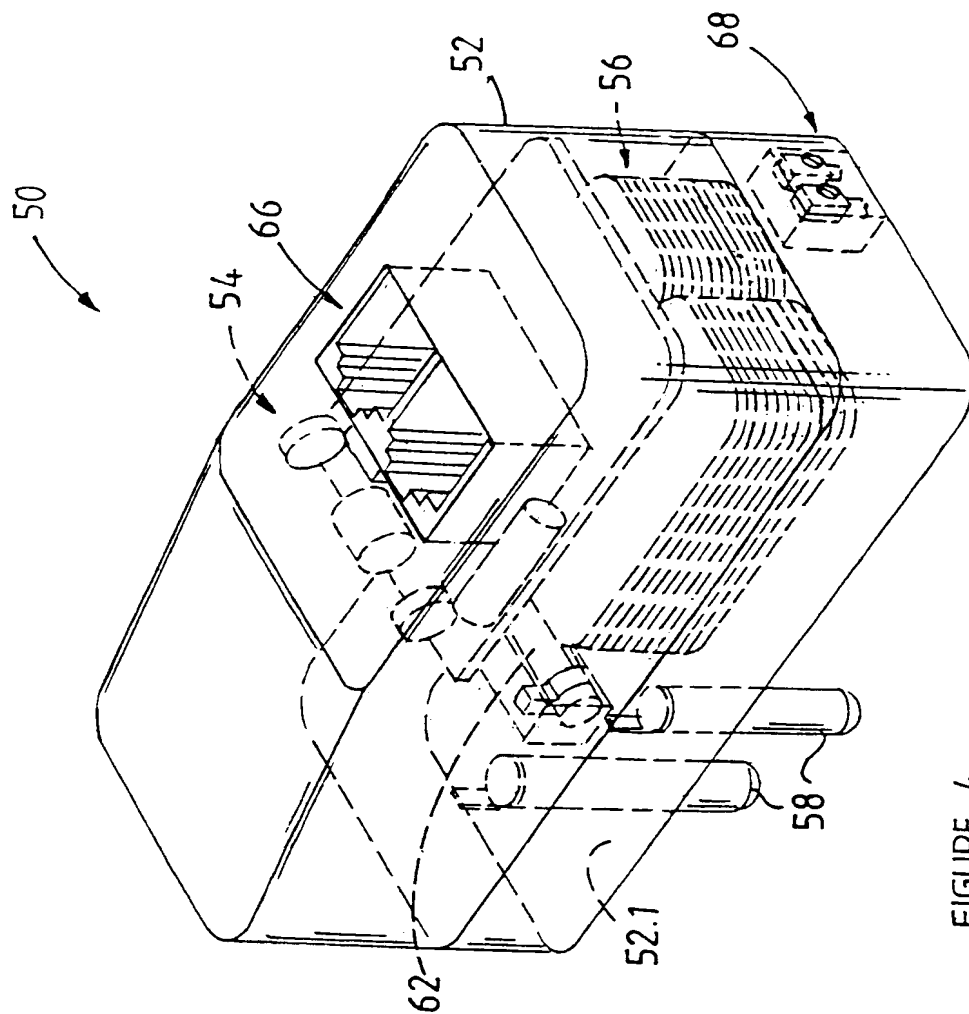


FIGURE 1 (PRIOR ART)

FIGURE 2



FIGURE 4

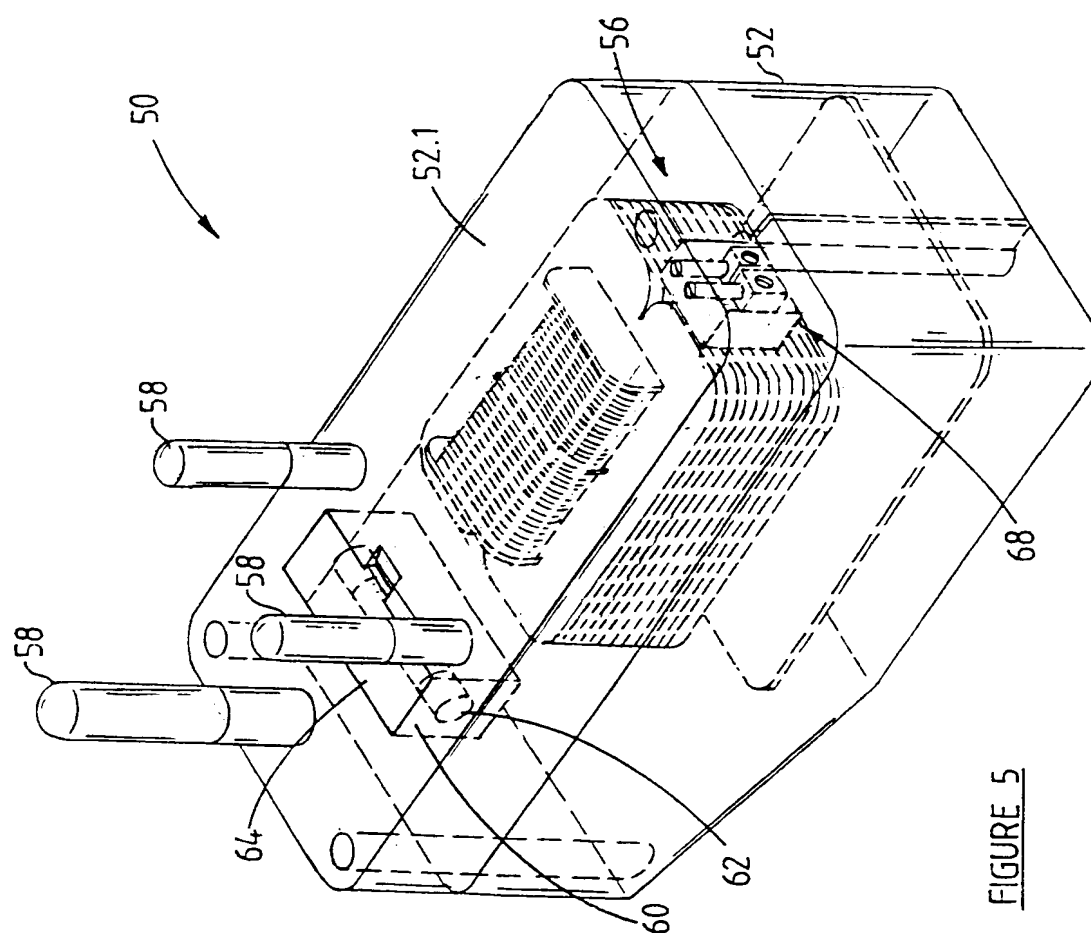


FIGURE 5

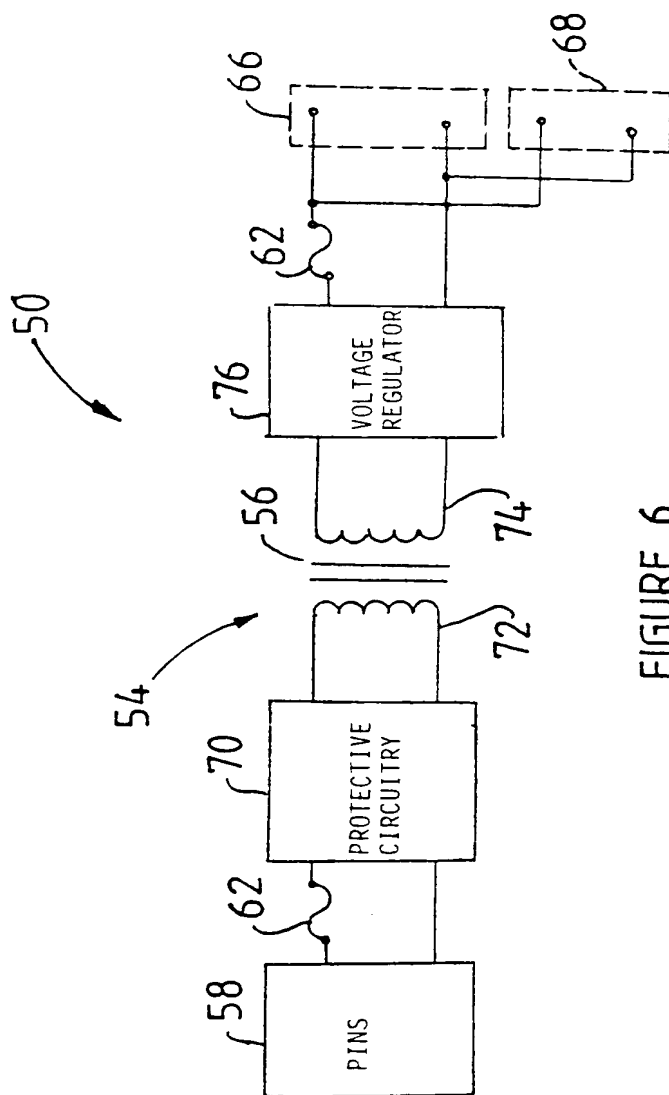


FIGURE 6

INTERNATIONAL SEARCH REPORT

Intern. Application No

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01F27/02 H01F41/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

PAJ, EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 006, no. 115 (E-115), 26 June 1982 (1982-06-26) & JP 57 043405 A (HITACHI LTD;OTHERS: 01), 11 March 1982 (1982-03-11) abstract	1,2,13, 14
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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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International Publication No

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